REMARKS

Claims 1-14 and 21-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunsmore (US 6,643,597 B1) and further in view of Kamitani (US 2004/0183542 Al). Applicant submits that as currently amended, claims 21-25 are not obvious in view of the cited prior art. Applicant traverses the rejection of claims 1-14 and 26-31.

With respect to independent claims 1 and 26,..."21" is referenced below, see ? in next paragraph the Examiner states that Dunsmore teaches all the limitations except for (1) determining a port-specific difference array, the difference array describing a difference between a first test fixture and a second test fixture at a corresponding test port of the test fixtures, and (2) measuring a performance of the DUT using the test system, wherein the DUT is mounted in the second test fixture. The Examiner looks to Kamitani for the missing teachings. The Examiner maintains it would have been obvious to apply the method of Kamitani to the method of Dunsmore to "provide high calibration accuracy and to satisfy multi-port requirements (e.g. [0014]; Kamitani)". Applicant disagrees with the Examiner's interpretation of Kamitani as providing the teachings missing from Dunsmore regarding the port-specific difference array.

Paragraphs [0085] to [0087], cited by the Examiner, teach a method for determining a correction coefficient that is used to correct a measurement of a DUT made using a production test fixture to yield the DUT measurement that would have been obtained if a standard test fixture had been used instead, but does not teach that the correction coefficient describes a difference between the fixtures **at a corresponding test port of the test fixtures,** as the claim requires. Kamitani is silent regarding correspondence between any port of the standard test fixture and any port of the production test fixture during any of the measurements taught. Hence, Applicant submits that Kamitani does not teach the determination of a **port-specific** difference array as the claims specify.

Accordingly, Applicant submits that the Examiner has failed to make a *prima facie* case for obviousness with respect to claim 1, claim 26 ? or 21 and 26 as both refer to "port-specific difference array" , and the claims dependent therefrom.

Claim 3 depends from claim 1 and further requires that characteristics of a set of calibration standards are measured **at corresponding ports** of the two test fixtures by separately inserting each calibration standard of the set in each test fixture **at a respective port**; and solving for elements of the difference array using results obtained from measuring characteristics of the calibration standard set for each test fixture. The Examiner points to Dunsmore (col. 14, lines 61-67 & col. 15, lines 1-13 & col. 18, lines 55-67 & col. 19, lines 1-10) and to Kamitani (paragraphs [0096-0097]) as providing this teaching.

Applicant submits that the passages in Dunsmore to which the Examiner points discuss models and their optimization, but do not disclose the measurement of calibration standards in the manner specified by this claim. Applicant submits that the passages in Kamitani to which the Examiner points discuss a matrix transformation method to model an error neutralization adapter, but are silent regarding ports of the two test fixtures, and certainly do not disclose the measurement of calibration standard by insertion at test fixture ports in the manner specified by the claim.

Hence, Applicant submits that there are additional grounds for allowing claim 3 and the claims dependent therefrom.

Claim 13 depends from claim 3 and further requires that the measuring and solving are repeated for each port or each pair of ports of each of the test fixtures. The Examiner points to Dunsmore (col. 14, lines 61-67 & col. 15, lines 1-13 & col. 18, lines 55-67 & col. 19, lines 1-10) and to Kamitani (paragraphs [0096-0097]) as providing this teaching.

Applicant submits that the passages in Dunsmore to which the Examiner points discuss models and their optimization, but do not disclose the measuring and solving for each port or each pair of ports of each test fixture. Applicant submits that the passages in Kamitani to which the Examiner points discuss a matrix transformation method to model an error neutralization adapter, but do not discuss ports, either singly or in pairs, of the test fixtures, and do not disclose the repetition of the measuring and solving as specified by the claim.

Hence, Applicant submits that there are additional grounds for allowing claim 13.

Claim 6 depends from claim 1 and further requires that a performance of one or both of the test fixtures **and** a performance of one or more calibration standards of the set used in determining the port-specific difference array are unknown or poorly known. The Examiner points to column 6, lines 48-57 of Dunsmore as providing the additional teaching. Applicant submits that the passage to which the Examiner points discusses the use of calibration standards with unknown or poorly known performance characteristics but does not teach that the performance of any **test fixture** is unknown or poorly known, as required by the claim. Hence, Applicant submits that there are additional grounds for allowing claim 6.

Claim 7 depends from claim 1 and further requires that determining a port-specific difference array employs measurements of the test fixtures determined at a plurality of frequencies in a frequency range of interest for the DUT. The Examiner points to column 7, lines 33-51 of Dunsmore as teaching the additional requirement that determining a port-specific difference array employs measurements of the test fixtures determined at a plurality of frequencies in a frequency range of interest for the DUT. Applicant submits that the passage to which the Examiner points merely refers to an operational frequency range of the DUT and states that the calibration method taught by Dunsmore "may include a broader frequency range than the frequency range of interest". Applicant submits that, at most, Dunsmore teaches that measurements of calibration standards in a given test fixture are made at a plurality of frequencies, used to optimize models of the standards and of that test fixture, and in turn create a calibration array corresponding to that test fixture. Applicant submits that the Examiner has not pointed to any teaching regarding the making of measurements of two **test fixtures** at a plurality of frequencies in order to generate the terms of the difference array, as required by the claim. Hence, Applicant submits that there are additional grounds for allowing claim 7.

Claim 8 depends from claim 1 and further requires that the set of calibration standards connects **corresponding pairs of ports together** so that all combinations of ports in each test fixture are **separately connected as pairs** for measuring the characteristics.. The Examiner points to column 12, lines 5-21 of Dunsmore as providing the additional required teaching that Applicant submits that the cited passage, at most, teaches that one *thru* standard is used to connect one input portion and one output portion of one test fixture. The Examiner has not

pointed to any disclosure that all combinations of ports in each test fixture are separately connected as pairs. Hence, Applicant submits that there are additional grounds for allowing claim 8.

Claim 12 depends from claim 3 and further requires optimizing a model using the measured results for each test fixture, the model representing one or more of the port-specific difference arrays, wherein optimizing comprises adjusting parameters of the model until a difference between test fixture measurements is minimized, the test fixture measurements being converted measurements of the second test fixture produced by the model using the measured results for the second test fixture and the measured results for the first test fixture, the model parameters representing the elements of the difference array. The Examiner points to Dunsmore col. 8, lines 1-35 as providing the additional teaching, Applicant submits that the passage cited by the Examiner discusses computer models in a general way, offering no specific teachings regarding ports, difference arrays, optimization, or conversion between the two test fixtures. Hence, Applicant submits that there are additional grounds for allowing claim 12.

Claims 14 and 29 depend from claims 3 and 26 respectively and further require that solving for elements of the difference arrays comprises determining a complex square root of one of the elements. The Examiner points to column 13, lines 51-62 of Dunsmore as providing the additional teaching. Applicant submits that the passage in question relates to the use of the "least squares" metric, which is a mathematical technique of finding the "best fit" to a set of data by minimizing the sum of the squares of the differences between the fitted function (or model) and the data. The claim limitation in question relates to finding a complex square root of one element in a difference array. The two mathematical operations are quite different. Hence, Applicant submits that there are additional grounds for allowing claims 14 and 29 and the claims dependent therefrom.

Claim 21 has been amended to make it clear that the **port-specific difference array** adjusts for a difference between a first test fixture and a second test fixture when each is used to interface the DUT for measurements **at a corresponding test port**. As noted above with regard to claims 1 and 26, Applicant submits that the correction coefficient taught by Kamitani is not specific to corresponding ports of the two test fixtures. Dunsmore does not

provide the required teaching. Hence, Applicant submits that claim 21 and the claims dependent therefrom are not obvious in view of the cited prior art.

Claim 25 depends from claim 21 and additionally requires that the computer program comprises instructions that implement determining a complex square root of an element of the difference array using values of the element at a plurality of frequencies. As noted above with respect to claim 14, Applicant submits that Dunsmore discusses the use of the "least squares" metric, which is a mathematical technique of finding the "best fit" to a set of data by minimizing the sum of the squares of the differences between the fitted function (or model) and the data, but Dunsmore does not teach finding a complex square root of one element in a difference array. Hence, Applicant submits that there are additional grounds for allowing claim 25.

Claims 15-20 and 32 were rejected under 35 U.S.C. 102(e) as being anticipated by Kamitani (US 2004/0183542 Al). Claim 32 has been canceled, rendering its rejection moot. Applicant traverses the rejection of claims 15-20.

Claim 15 requires adjusting a calibration of the test system using differences between the measured parameters for **corresponding ports of each test fixture**, wherein the adjusted calibration is a **port-specific calibration** of the test system such that measurements taken with the test system for a device under test (DUT) in either test fixture approximate each other. The Examiner points to Kamitani (paragraphs [0085-0086], [0096-0097]) as providing these teachings.

The paragraphs cited by the Examiner teach a method for calibrating a production test fixture into which a DUT is mounted for measurement to "correct" the measurement to the value that would have been obtained if a standard test fixture had been used instead, but the paragraphs are silent regarding any differences between the measured parameters for **corresponding ports** of each test fixture. Hence, Applicant submits that the calibration method taught by **Kamitani** is not **port-specific** as the claim requires.

Accordingly, Applicant submits that Kamitani does not anticipate claim 15 and the claims dependent therefrom.

Claim 16 depends from claim 15 and further requires that measuring parameters of the first test fixture and the second test fixture comprises mounting a calibration standard to connect between a **corresponding pair** of ports of each test fixture and measuring parameters for each **corresponding pair of ports** of the test fixtures using a set of calibration standards, a **different standard** connecting a different corresponding pair of ports for each measurement , wherein at least one of the calibration standards of the set is a *thru* standard. The Examiner points to paragraphs [0095-0097] as providing the additional teaching.

Applicant submits that the cited paragraphs are silent regarding (1) any correspondence between pairs of ports of the two test fixtures, (2) a different standard connecting ports as specified, and (3) any *thru* standard. Hence, there are additional grounds for allowing claim 16.

Claim 17 depends from claim 15 and further requires that the adjusting comprises: determining a **port-specific difference array for each port** of the second test fixture from results of measuring parameters. The Examiner points to paragraphs [0098-0099] as providing the additional teaching. First, as noted above with respect to claims 1 and 15, Applicant submits that neither the calibration method taught by Kamitani nor the correlation coefficient, which the Examiner is presumably identifying as an element of the difference array, are taught to be specific to ports of the fixture, and hence, Kamitani does not teach the port-specific difference array required by the claim. Second, the cited passages do not teach that anything is determined for **each port** of the second test fixture, as the claim requires.

Accordingly, there are additional grounds for allowing claim 17 and the claims dependent therefrom.

Claim 18 depends from claim 17 and further requires constructing a **port-pair model** of the second test fixture with a specific error adaptor attached to each port of a pair of ports and a ***thru* calibration standard** mounted in the second test fixture connecting the pair of ports, such that a **separate model is constructed for each pair of ports** of the second test fixture, each port-pair model converting a respective measured parameter into a

corresponding converted measured parameter of the second test fixture; and **optimizing the port-pair model for each pair of ports** of the second test fixture such that the converted measured parameters approximate the measured parameters of the first test fixture. The Examiner points to paragraphs [0019], [0095-0099] as providing these teachings.

Applicant submits that there is no teaching in the cited passages regarding the construction or optimization of even one **port-pair model**, or the use of any thru calibration standard mounted as the claim requires. Hence, there are additional grounds for allowing claim 18 and the claims dependent therefrom.

Claim 19 depends from claim 18 and further requires that optimizing **attempts to reduce a difference** between the converted measured parameters of the second test fixture and the measured parameters of the first test fixture, such that **when an optimization goal is reached, the error adaptors of the port-specific difference arrays are considered determined**. The Examiner points to paragraphs [0019], [0095-0099] as providing these teachings. Applicant submits that the cited passages teach a scattering coefficients matrix transformation and inversion process by which test fixture errors may be modeled, but do not teach any optimization process that attempts to reduce a difference, as the claim requires. Hence, there are additional grounds for allowing claim 19.

Claim 20 depends from claim 15 and further requires that measuring parameters comprises measuring at a plurality of frequency points in a frequency range of interest for the DUT. The Examiner points to paragraphs [0078], [0106], [0111] as providing this teaching. Applicant submits that the first of the cited paragraphs teaches only that the network analyzers are capable of measuring DUTs that operate at high frequencies, while the second and third of the cited paragraphs teach only that a single measurement may be made at a frequency in the several GHz range. None of these amount to teaching that measurements are made at a plurality of frequency points, as the claim requires. Hence, there are additional grounds for allowing claim 20.

Respectfully Submitted,

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Date: June 2, 2008

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